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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/821,171	04/09/2004	Jin-ho Kim	1572.1341	8400

21171 7590 04/18/2007
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EXAMINER

TAOUSAKIS, ALEXANDER P

ART UNIT	PAPER NUMBER
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3726

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/18/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No. 10/821,171	Applicant(s) KIM ET AL.	
	Examiner Alexander P. Taousakis	Art Unit 3726	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 February 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) 7-12 and 19 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6, 13-18 and 20-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>04/09/2004</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

Applicant's election without traverse of Group I, Claims 1-6, 13-18, and 20-23 in the reply filed on 02/07/2007, is acknowledged.

Specification

The disclosure is objected to because of the following informalities:

On page 5, paragraph [0023], line 9, "23" should be changed to ---25---.

On page 7, paragraph [0033], line 2, "second cooling tube 26" should be changed to ---second cooling tube 25---.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-2, 5-6, 14-18, and 22-23 are rejected under 35 U.S.C. 102(b) as being anticipated by Ikeya et al (Patent No.: 5,482,115).

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Claim 1:

Ikeya et al teaches the method of manufacturing an evaporator (*see column 1 lines 7-9*), comprising forming at least one cooling fin **2** (*Figure 2(b)*) with at least first and second coolant tube accommodation parts **5** (*see Figure 2(b)*), inserting first and second coolant tubes **8a**, **8b** into the first and second coolant tube accommodation parts **5** (*see Figure 2(b)*), expanding the first and second coolant tubes after the inserting (*see column 2, lines 13-20*), bending the first coolant tube **8a** around a first jig **21** at a first position and the second coolant tube **8b** around a second jig **22** at a second position, the first and second positions spaced apart at different levels relative a first position along a first axis (*In Figure 7(b), the line containing the first and second coolant tube **8a**, **8b** and inclined towards first jig **21***), to form first and second horizontal parts of the first and second coolant tubes **8a**, **8b** respectively (*see Figures 7(a) and 7(b)*), and connecting a first end of a first coolant tube **8a** to a first end of a second coolant tube **8b** (*note that it is inherent the first and second coolant tubes will be connected when used in an evaporator*), wherein the first and second coolant tube accommodation portions **5** of the cooling fin **2** are coupled to a corresponding horizontal part of the first and second coolant tubes **8a**, **8b**, respectively, and wherein the cooling fin **2** is inclined at an inclination angle relative to the first axis (*Figure 7(b)*).

Claim 2:

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Ikeya et al teaches the method of claim 1, wherein each second horizontal part **5** is provided in the rear center part between the corresponding first horizontal parts **5** (see *Figure 2(a)*).

Claim 5:

Ikeya et al teaches the method of claim 1, wherein the cooling fin **2** includes at least one protrusion **3** protruding orthogonally from a surface of a cooling fin **2** (*Figure 2(b)*).

Claim 6:

Ikeya et al teaches the method of claim 1, wherein the cooling fin has a substantially rectangular plate shape (see *Figure 2(a)* and column 3 lines 9-14, and note that the fin sections **2a**, **2b** between weakened lines **10** form fins having a substantially rectangular plate shape).

Claim 14:

Ikeya et al teaches an evaporator comprising a fin **2** with a protrusion **3** provided for reinforcement of the fin **2** (see *Figure 2(b)* and column 3 lines 20-21). Protrusion **3** will inherently create turbulent airflow.

Claim 15:

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Ikeya et al teaches the method of claim 1, further comprising supporting the first and second jigs **21, 22** with first and second jig plates during bending of the first and second coolant tubes **8a, 8b** (*Figures 7(a) and 7(b)*).

Claim 16:

Ikeya et al teaches the method of claim 1, wherein the bending of the first and second tubes **8a, 8b** are performed simultaneously (*see Figure 7(b)*).

Claim 17:

Ikeya et al teaches the method of claim 15, wherein a respective first end of the first and second jigs **21, 22** (*Figure 7(a)*) are rotatably connected to a corresponding jig plate **20** so that a respective second end of the first and second jigs **21, 21** are movable toward and away from each other.

Claim 18:

Ikeya et al teaches the method of claim 1, wherein the bending of the first and second coolant tubes **8a, 8b** imparts a zigzag shape to the first and second coolant tubes **8a, 8b** (*see Figure 7(b) and column 1 lines 36-38*).

Claim 22:

Ikeya et al teaches the method according to claim 1, wherein the inclination angle of the cooling fin **2** is based on a difference in the respective positions of the first and second horizontal parts **5** along the first axis (*Figure 7(b)*).

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Claim 23:

Ikeya et al teaches the method of claim 1, wherein the protrusion prevents the cooling fin 2 from substantially bending (see column 3 lines 21-22).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 3-4, 13 and 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ikeya et al (Patent No.: 5,482,115) as applied to the claims above, and further in view of Sin et al (Pub No.: 2003/0159814 A1)

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Claim 3:

Ikeya et al teaches an evaporator with a cooling fin **2** (*Figure 2(a)*) that comprises sharp portions **2a**, **2b** and collars **5**.

Ikeya et al fails to teach a cooling fin including a bottom end and a round part rounded on upper opposite corners of the bottom end.

Sin et al teaches an evaporator including a cooling fin with a bottom end and a round part rounded on upper opposite corners of the bottom end (*Figure 2*).

It would have been obvious to one of ordinary at the time the invention was made to manufacture the evaporator of Ikeya et al, with fins comprising rounded opposite corners, as taught by Sin et al, because the rounded configuration will reduce the risk on injury during servicing and cause condensed water to be directed away from the fin **2** and thereby improve air flow through the evaporator.

Claim 4:

Ikeya et al teaches an evaporator, wherein the cooling fin is inclined at an inclination angle relative to a first axis.

Ikeya et al fails to teach that the inclination angle is between 50 and 75 degrees.

Sin et al teaches an evaporator comprising cooling fins, wherein an inclination angle between a longitudinal direction of the cooling fin (*Figure 18A, the lead line along 22*) and the first axis (*see Figure 18A, the line containing the lower two holes 21*) is approximately between 50 and 75 degrees (*see page 2, [0032], where it discloses that the angle θ is preferably 23° and note that the lowest three holes approximately form a*

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right triangle, so the difference between the longitudinal direction of the cooling fin and the angle θ will be approximately 68°).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to produce the evaporator of Ikeya et al with the cooling fin inclined between 50 and 75 degrees, as taught by Sin et al, because the inclination directs condensation on the coolant tubes **8a**, **8b** off the fin **2**, and therefore provides resistance to frost accumulation on the tubes of the evaporator and improve the air flow through the evaporator.

Claim 13:

Ikeya/Sin combination teaches an evaporator comprising an inclined cooling fin comprising a bottom end and a round part rounded on upper opposite corners of the bottom end.

Ikeya/Sin fail to teach a cooling fin comprising a rounded part having a radius approximately between 3 mm and 50 mm.

It would have been an obvious matter of design choice to one of ordinary skill in the art at the time the invention was made to have produced a cooling fin comprising a rounded part having a radius between 3 mm and 50 mm because applicant has not disclosed that a radius of 3 mm to 50 mm provides an advantage, is used for a particular purpose, or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected applicant's invention to perform equally well with either radius as taught by Ikeya/Sin combination or the claimed radius because either

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will perform the same function of improving flow characteristics and directing condensed water along the fin equally well. Therefore, it would have been an obvious matter of design choice to modify the fin 2 of Ikeya/Sin to obtain a radius of 3 mm to 50 mm.

Claim 20:

Ikeya/Sin teach the method according to claim 3, wherein the inclination angle and the round parts of the cooling fin cause defrosted water to discharge from the evaporator.

Claim 21:

Ikeya/Sin teach the method according to claim 3, wherein the bottom end of the cooling fin 2 is adjacent to a wall of the evaporator accommodation part *(note that it is inherent the evaporator of a refrigeration device will be adjacent to a wall since refrigerators are designed to maximize useable space, and therefore the various components of the refrigerator will be fitted tightly).*

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexander P. Taousakis whose telephone number is

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(571) 272 – 3497. The examiner can normally be reached on Monday-Friday (7:30-4:00).

If attempts to reach the examiner by telephones are unsuccessful, the examiner's supervisor, David P. Bryant can be reached at (571) 272- 4526.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published publication may be obtained from either private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Alexander P. Taousakis

Examiner

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AT

4/16/2007



DAVID P. BRYANT
SUPERVISORY PATENT EXAMINER

4/16/07